

The Cognitive Psychology Unit of the Institute of Psychology at Leiden University and the Leiden Institute for Brain and Cognition (LIBC) are looking for a highly talented researcher for a

Postdoc Position (1.0 fte) in Cognitive Neuroscience

Vacancy number 19-584 6625

Title: The role of noradrenergic arousal in reward-based learning and decision-making

The project is part of a research program "*The impact of arousal on cognitive function and cortical state*" funded by a Vici grant of the Netherlands Organisation for Scientific Research, awarded to prof. Sander Nieuwenhuis: The waking state is characterized by constant, sometimes large, fluctuations in arousal level. Recent research suggests that such fluctuations in arousal account for a large proportion of the variability in task performance and spontaneous patterns of cortical activity (cortical state). However, the exact ways in which arousal affects the human brain, mind and behavior are still poorly understood. The major aim of the research program is to characterize the computational and neural mechanisms by which moment-to-moment fluctuations in arousal affect cognitive functions and cortical state.

In this postdoc project, we will examine the role of the noradrenergic brainstem arousal system in reward-based learning and decision-making. Recent theoretical and empirical work on reward-based decision-making in volatile environments has suggested that behavioural variability does not only reflect random variability during the choice process (i.e., exploration), but also random variability during the updating (learning) of action values. The goal of the proposed project is to examine the degree to which these two (often adaptive) sources of variability in human decision-making are regulated by activity of the noradrenergic system. We will use a recently developed computational (reinforcement-learning) model to decompose human behaviour into distinct learning and choice processes. We will test how a pharmacological manipulation of the noradrenergic system alters random choice and learning variability, pupil-linked arousal, and neural (EEG/fMRI) activity in decision-making areas of the brain. We will also examine the link between inter-individual differences in locus coeruleus integrity (using structural MRI) and sources of behavioral variability.

The postdoc project will be carried out in close collaboration with dr. Valentin Wyart and his lab in Paris (<https://sites.google.com/site/valentinwyart/>). In Leiden, the postdoc will be a member of a team of six researchers working on the Vici project. The research group will participate in the Leiden Institute for Brain and Cognition (LIBC), an interfaculty center for interdisciplinary research on brain and cognition (www.libc-leiden.nl).

Key Responsibilities

- Literature study, development and execution of behavioral and neuroimaging studies;
- Report results at conferences and in international journals;
- Supervise BSc and MSc thesis projects;
- Participate in the Leiden Institute for Brain and Cognition (LIBC).

Selection Criteria

- PhD degree in cognitive psychology, cognitive neuroscience or closely related field;
- Experience or affinity with neuroimaging techniques and computational modeling;
- Programming experience (e.g., Python, Matlab);
- Excellent research and writing skills;
- Excellent command of English.

Our faculty

The Faculty of Social and Behavioural Sciences comprises four institutes: Education and Child Studies, Political Science, Psychology and Cultural Anthropology & Development Sociology. The Faculty also includes the Centre for Science and Technology Studies. The Faculty is home to 5,000 students and 600 members of staff. Our teaching and research programmes cover diverse topics varying from adoption to political behaviour. For more information, see <http://www.universiteitleiden.nl/en/social-behavioural-sciences>.

For research in our institute we offer an exciting research environment including EEG, fMRI, eye tracking, virtual reality, and brain stimulation. For more information see <https://www.universiteitleiden.nl/en/social-behavioural-sciences/psychology/cognitive-psychology> and <http://www.libc-leiden.nl/>

Terms and conditions

We offer a full-time, fixed-term post for 2.5 years, including a 2-month trial period. Salary range from € 3637 to € 4978 gross per month (pay scale 11, in accordance with the Collective Labour Agreement for Dutch Universities). Preferred starting date is between April and September 2020 (but this is negotiable).

Leiden University offers an attractive benefits package with additional holiday (8%) and end-of-year bonuses (8.3%), training and career development. Our individual choices model gives you some freedom to assemble your own set of terms and conditions. Candidates from outside the Netherlands may be eligible for a substantial tax break. More at <https://www.universiteitleiden.nl/en/working-at/job-application-procedure-and-employment-conditions>.

Diversity

Leiden University is strongly committed to diversity within its community and especially welcomes applications from members of underrepresented groups.

Information

For inquiries, please contact professor Sander Nieuwenhuis, email snieuwenhuis@fsw.leidenuniv.nl.

Applications

Please submit online your application no later than 1 February 2020 via the blue button of our application system. Applicants should submit online a letter of interest and a cv with a list of publications.